

**1996**  
**Research Fellow Project**

**The Persian Gulf War:  
Military Doctrine and Strategy**

**Marsha J. Loges**  
*Department of the Air Force*  
*Civilian*

*Faculty Research Advisor*  
*Dr. Alan L. Gropman*



**DTIC QUALITY INSPECTED 2**

**The Industrial College of the Armed Forces**  
**National Defense University**  
**Fort McNair, Washington, D.C. 20319-5062**

**19961001 008**

## REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION. UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY N/A			3. DISTRIBUTION/AVAILABILITY OF REPORT Distribution Statement A: Approved for Public Release: distribution is unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)  NDU-ICAF-96-			5. MONITORING ORGANIZATION REPORT NUMBER(S)  N/A		
6a. NAME OF PERFORMING ORGANIZATION Industrial College of the Armed Forces		6b. OFFICE SYMBOL (if applicable) ICAF-FA	7a. NAME OF MONITORING ORGANIZATION  National Defense University		
6c. ADDRESS (City, State, and ZIP Code) Fort McNair Washington, D.C. 20319-6000			7b. ADDRESS (City, State, and ZIP Code) NDU-LD-SCH Ft. McNair Washington, D.C. 20319-6000		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION N/A		8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER  N/A		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
11. TITLE (Include Security Classification) <i>The Persian Gulf War: Military Doctrine and Strategy</i>					
12. PERSONAL AUTHOR(S) <i>Ms. Marsha J. Loges, Department of the Air Force</i>					
13a. TYPE OF REPORT Research		13b. TIME COVERED FROM Aug 95 TO Apr 96		14. DATE OF REPORT (Year, Month, Day) April 1996	
15. PAGE COUNT 76					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP			
19. ABSTRACT (Continue on reverse if necessary and identify by block number)  See Attached					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL Susan Lemke			22b. TELEPHONE (Include Area Code) (202) 685-3957		22c. OFFICE SYMBOL NDU-LD-SCH

**DISCLAIMER**

**This research report represents the views of the author and does not necessarily reflect the official opinion of the Industrial College of the Armed Forces, the National Defense University, or the Department of Defense.**

**This document is the property of the United States Government and is not to be reproduced in whole or in part for distribution outside the federal executive branch without permission of the Director of Research and Publications, Industrial College of the Armed Forces, 408 4th Avenue, Fort McNair, D.C. 20319-5062.**

**AS 292 - Research Paper -**

**The Persian Gulf War:**

**Military Doctrine and Strategy**

**Abstract**

This paper documents analysis of the effects of military doctrine and strategy in the Persian Gulf War. In particular, it focuses on United States Air Force (USAF) airpower doctrine and its contribution to the success of the Gulf Conflict.

The study first examines the situation which led to Iraq's aggression in the Persian Gulf, and the U.S. and Coalition response. It considers the political objectives and strategies, military leadership and strengths, and other strategic factors which influenced the military strategies implemented by the opposing forces during the Gulf Conflict. It then focuses on an assessment of the successes and failures of the opposing forces, using the Principles of War as an analytical framework. The examination then explores the outcome of the Gulf Conflict and, based on the Iraqi and the U.S. performance and experiences of that war, draws lessons about forces, weapons, combat doctrine, and especially about the role of airpower.

Analysis of all these factors supports the position that United States Air Force (USAF) Aerospace Doctrine played the dominant role in the warfighting strategy employed in the Persian Gulf War. A highly skilled, professional military force executed the well-planned air campaign with precision. Application of Army AirLand Battle Doctrine in the final phase of the conflict assured victory for the Coalition.

**AS 292 - Research Paper -**  
**The Persian Gulf War:**  
**Military Doctrine and Strategy**  
**Table of Contents**

<b><u>Section</u></b>	<b><u>Page</u></b>
<b>Abstract</b>	<b>i</b>
<b>List of Tables.</b>	<b>iv</b>
<b>Acknowledgments.</b>	<b>v</b>
<b>1. Issue Statement - Impacts of Military Doctrine and Strategy</b>	
<b>in the Persian Gulf War.</b>	<b>1</b>
<b>2. Conflict in the Gulf: Situation, Aggression, Response.</b>	<b>4</b>
<b>2.a. Situation.</b>	<b>4</b>
<b>2.b. Aggression.</b>	<b>5</b>
<b>2.c. Response.</b>	<b>6</b>
<b>3. Strategic Factors Influencing Military Strategies</b>	
<b>of the Opposing Forces.</b>	<b>8</b>
<b>3.a. Political Objectives and Strategies.</b>	<b>8</b>
<b>3.b. Military Leadership and Strengths.</b>	<b>10</b>
<b>3.c. Technology and Manpower.</b>	<b>13</b>
<b>3.d. Role of Airpower.</b>	<b>16</b>

<b>4. Assessment Based on the Application of the Principles of War.</b>	<b>29</b>
4.a. Analytical Framework.	29
4.b. Analysis of Application of Principles.	298
<b>5. Outcome and Lessons from the Gulf Conflict.</b>	<b>47</b>
5.a. Outcome.	47
5.b. Iraqi Lessons.	52
5.c. U.S. Lessons.	53
<b>6. Summary and Recommendations.</b>	<b>58</b>
6.a. Summary of Findings.	59
6.b. Recommendations.	59
<b>End Notes.</b>	<b>61</b>

**AS 292 - Research Paper -**  
**The Persian Gulf War:**  
**Military Doctrine and Strategy**  
**List of Tables**

<b><u>Table</u></b>	<b><u>Page</u></b>
<b>1. Allied Forces in the Gulf Theater</b>	<b>21</b>
<b>2. Armed Forces of Kuwait, Saudi Arabia, and United States: 1990</b>	<b>23</b>
<b>3. Iraqi Air Orders of Battle</b>	<b>24</b>
<b>4. Coalition Air Orders of Battle</b>	<b>25</b>
<b>5. Selected Munitions Employed</b>	<b>26</b>
<b>6. Weapons Expenditures (and % of Total U.S. Expenditures)</b>	<b>27</b>
<b>7. Missiles Employed in Desert Storm Strikes</b>	<b>28</b>
<b>8. Strategic Air Targets</b>	<b>41</b>
<b>9. Operational Strategic Summary</b>	<b>42</b>
<b>10. CENTCOM Administrative Chain of Command</b>	<b>44</b>
<b>11. CENTCOM Operational Chain of Command</b>	<b>45</b>
<b>12. Joint Air Forces CENTCOM Chain of Command</b>	<b>46</b>

**AS 292 - Research Paper -**  
**The Persian Gulf War:**  
**Military Doctrine and Strategy**  
**Acknowledgments**

The author acknowledges the invaluable assistance provided by the following:

Dr. Alan L. Gropman, Professor, Industrial College of the Armed Forces

National Defense University Library Staff



Warfare is the greatest affair of state, the basis of life and death, the Way (Tao) to survival or extinction. It must be thoroughly pondered and analyzed.

Sun Tzu, The Art of War<sup>1</sup>

**Issue Statement - Impacts of Military Doctrine and Strategy in the Persian Gulf War.**

*United States Air Force (USAF) Aerospace Doctrine, which evolved throughout more than eighty years of military powered flight, played the dominant role in the warfighting strategy employed in the Persian Gulf War. A highly skilled, professional military force, exploiting advanced airpower capabilities using high-technology weaponry, executed the well-planned air campaign with precision. Application of Army AirLand Battle Doctrine in the final phase of the conflict assured victory for the Coalition.*

Study of Military history can provide a sound basis for learning and understanding military strategy. War is an instrument of policy; a study of the successes and failures of past wars is necessary to learn and apply lessons to current policies, national strategies, and military strategies.<sup>2</sup>

Analysis of the Persian Gulf War, our most recent full-scale military conflict, is a means of viewing the application of all the lessons learned from all of our past conflicts to prepare for the next war. Former United States (U.S.) Representative, Chairman of the House Armed Services Committee, and U.S. Secretary of Defense Les Aspin wrote: "Military operations in Operation Desert Storm provide an unprecedented and valuable opportunity to measure, challenge and adjust the policies and assumptions that will provide the framework for U.S. defense budgeting and strategy in the years ahead."<sup>3</sup>

It has been five years since the end of the Persian Gulf War, and politicians, military leaders, strategists, journalists, and academicians continue to debate the conflict. Much has been written about the politics, forces, technologies, and strategies employed. Many of the books and articles focus on the factors contributing to the overwhelming success of the Coalition Forces, and especially the application of airpower doctrine and the achievement of air supremacy. Other writings take an objective look at varying degrees of success and failure of different aspects of the Gulf War, and derive lessons from that examination. *What can be concluded from observations regarding the Allied Coalition and the Iraqi forces' conduct of the campaign? What doctrine, strategies, and objectives were employed by the opposing forces? How did technology, experience, and military leadership influence the military strategy? What can be learned from the conduct and outcomes of the conflict?*

**United States Air Force (USAF) Aerospace Doctrine, which evolved throughout more than eighty years of military powered flight, played the dominant role in the warfighting strategy employed in the Persian Gulf War. A highly skilled, professional military force, exploiting advanced airpower capabilities using high-technology weaponry,**

**executed the well-planned air campaign with precision. Application of Army AirLand Battle Doctrine in the final phase of the conflict assured victory for the Coalition.**

Consideration of several strategic elements of the Gulf War contribute to this conclusion: political objectives and strategies of the opposing forces; military leadership and strengths; factors influencing military strategies; application of the Principles of War during the conduct of the war; and, lessons from the Gulf Conflict.

### Conflict in the Gulf: Situation, Aggression, Response.

*Iraq's invasion of Kuwait shocked the world community. Spurred by U.S. leadership, the nations united in condemning Hussein's aggressive actions and threatening retaliation if he did not withdraw. The resulting Gulf Conflict, which turned back the aggressor, provides a possible model for the study of Joint and Coalition military operations for the twenty-first century.*

The Persian Gulf War was a conflict of mammoth proportions and of short duration, which ought never to have happened. Borne of a defiant, proud, and ambitious dictator's misguided pursuit of political and military power and economic riches, it was a twisted David vs. Goliath drama; but in this version, the evil David - Iraq, was doomed to fail against the good Goliath - the Allied Coalition.

**Situation.** A long history of Middle East unrest, centering on worsening relations between Israel and the Palestinians, a long-standing border dispute between Iraq and Kuwait, and a devastating eight year bloody war between Iran and Iraq, preceded the hostile action in which Iraq - the largest military machine in the Arab world - invaded Kuwait and took control of its coastline and vast oil resources.

U.S.-Iraq relations in the 1970s were cool; Saddam Hussein was stridently anti-Western and anti-Israeli. In the 1980s both Iran and Iraq posed potential threats to American interests in the Gulf, and during the extended Iran-Iraq War, when Iraq turned to the U.S. for help, Iran was viewed as the larger threat. Thus, the U.S. under President Ronald Reagan tilted American policy towards Iraq, and by the end of the war in 1988 a new, albeit tenuous, relationship had emerged between Iraq and the U.S.<sup>4</sup>

In 1990 Saddam Hussein was viewed by much of the world as the Arab world's most influential and often feared political leader. As the self-proclaimed victor of the eight year war with Iran, he shaped a national agenda focused on the rebuilding of Iraq, expanding the Iraqi political power base and riches, and gaining his rightful place as a respected leader in the world. Saddam, a man of many faces and ever-changing positions and roles, portrayed himself as a "Saladin", a crusader-warrior, a religious man and a great nationalist, who at once would protect and unite his Arab brothers while winning power and riches for his nation and his people.<sup>5</sup>

**Aggression.** Saddam's swift invasion of Kuwait on 2 August 1990, and his claiming of it as Iraq's nineteenth province as payment for an outstanding Kuwaiti debt from the Iran-Iraq War, were typical of his devious and unpredictable actions as Commander of a massive military force. More plausible motives for his aggressive actions included: 1) acquiring Kuwait's considerable wealth and foreign investments; 2) claiming sole ownership of the rich Rumalia oil fields on the Iraq-Kuwaiti border; 3) controlling Kuwaiti over-production of oil which had been driving prices downward; and, 4) saving face, in view of the Emir's refusal to meet face-to-face at peace talks.<sup>6</sup>

Hussein's tactics included deception and mixed signals; while preparing his troops for invasion of Kuwait, he pretended to allow the Egyptians and Saudis to mediate peace and to

work towards settlement of Organization of Petroleum Exporting Countries (OPEC) disputes. His decision to invade Kuwait came at a time when the world's superpowers were celebrating their new post-Cold War status, and thus he expected the rest of the world to ignore his actions.<sup>7</sup>

**Response.** America and the rest of the world were, indeed, enjoying the end of the Cold War, the collapse of Communism in Eastern Europe, and the reunification of Germany. The "peace dividend" of this victory was a cutback in military defense spending. Past history, and especially the still painful memories of the deadly and divisive defeat in Vietnam, seemed to make U.S. involvement in a military operation to free tiny Kuwait most unlikely. Saddam perceived Americans as a society that would never accept 10,000 deaths in a single battle; in contrast, the Iraqi military had lost literally hundreds of thousands of its people in a bloody eight year battle with Iran.<sup>8</sup>

The Middle East foreign policies of both President Ronald Reagan and President George Bush sent mixed signals about our relationship with Iraq, given the ongoing Arab-Israeli tensions. Nonetheless, Saddam's decision to invade Kuwait in 1990 showed very poor timing, a poor assessment of the relationship of the U.S. with the other Western powers and especially with the Soviet Union, and a miscalculation of the will and leadership of the U.S. president. Bush reacted boldly and powerfully to Saddam's aggression in Kuwait, declaring "...what is at stake is more than one small country; it is a big idea: a new world order - where diverse nations are drawn together in a common cause, to achieve the universal aspirations of mankind: peace and security, freedom, and the rule of law."<sup>9</sup>

Led by the forceful U.S. and British governments, response to the Iraqi invasion of Kuwait was universal yet cautious; Saddam's actions were condemned and Iraq was isolated

internationally. Economic actions were undertaken to weaken the Iraqi nation and its military machine; United Nations (U.N.)-backed sanctions were issued, assets were frozen, and there was an outraged demand for immediate withdrawal from Kuwait.<sup>10</sup> The general feeling was that "...if the international community protested loudly enough, through the U.N. and the superpowers, Saddam Hussein would surely see that he made a mistake, and call his soldiers home."<sup>11</sup>

Whether U.S. resolve was motivated by the desire to create a new world order or to protect its own country's vast oil interests, was hotly debated; but certainly 1990 presented a springboard opportunity to shape the international future. The Eastern European revolutions, the new relationship with the Soviet Union, the shifting focus of the NATO threats, and the change in Middle East tensions, all invited decisive, cooperative action to shape fundamental change. Through his resolve and leadership, Bush was able to move the world community to action, and to influence agreement of the members of the U.N. Security Council, to bring together joint forces to expel Iraq. Options included the employment of economic, diplomatic, and military means, and all were used with varying degrees of commitment and impact. Because of Bush's influence, the unique factor present in the threat and actual application of each of these measures was unity; nearly every nation joined together, via the U.N., in condemning Saddam Hussein's aggressive actions and threatening retaliation if he did not withdraw from Kuwait.

### Strategic Factors Influencing Military Strategies of the Opposing Forces.

*Political objectives, military strengths, and other strategic factors influenced the military strategies implemented by the opposing forces during the Gulf Conflict.*

**Political Objectives and Strategies.** Several strategic factors influenced the selection of military strategies of the opposing forces during the Gulf Conflict. Primary among those factors were the strategic objectives which motivated their commitment to battle. Saddam Hussein's seizure of Kuwait was part of his plan to dominate the oil-rich Persian Gulf. His military forces made movements which suggested possible invasion into Saudi Arabia and seizure of its vast oil resources as well, and he also was in a position to threaten the oil-rich Gulf sheikdoms. His control of Gulf ports in Kuwait put him in a good defensive posture, should he continue his aggressive actions to dominate most of the world's oil reserves and much of the world's production. That would also provide the economic and political leverage necessary to access technology, tools, and materials for continued nuclear, biological, chemical, (NBC) and ballistic missile weapons development.<sup>12</sup>

Having overtaken Kuwait, Saddam's strength was in possession: Kuwait was firmly under Iraq's control. It would be many months before an American military attack to liberate



Kuwait would be feasible, and the riches Iraq seized from Kuwait could offset the effects of the economic blockade. Saddam believed that the Arab world would eventually join with Iraq against the U.S., a friend of Israel. He also relied on memories of the past Vietnam experience to evoke internal U.S. pressure to reach a quick compromise, short of military action. He viewed the possible negotiation of a forced withdrawal, and a compromise settlement involving territorial or financial compensation, as a victory for Iraq.<sup>13</sup>

Saddam's military doctrine reflected his national and military strategies; all resources, including Iraq's people, were expendable in the pursuit of the objectives of political and military expansion, growth in riches via acquisition and control of world oil production, and leadership of the Arab world. Military action was characterized by offensive invasion followed by defensive victory through attrition.

In response, the Coalition's objectives were to defy Iraq's aggression, defend the world's supply of oil, and liberate Kuwait. The Coalition hoped to strip Hussein of his offensive military capability, set back Iraq's pursuit of nuclear weapons, frustrate Iraq's efforts to draw Israel into war, and build a foundation for peaceful progress and stability in the region.<sup>14</sup>

The international allied coalition built through President Bush's influence, which formed and deployed to the Gulf in the five month Desert Shield buildup, was made up of forty countries, led by many of the world's powers. The Coalition forces followed the U.S. warfighting doctrine, consistent with Air Force Manual (AFM) 1-1 Aerospace Doctrine, and Army Field Manual (FM) 100-5 AirLand Battle Doctrine. Campaign strategic planning and airpower actions were influenced greatly by belief in the critical importance of target selection, and gaining and holding air superiority.<sup>15</sup>

The U.S. and Coalition political strategy recognized and was designed to achieve four basic objectives, in support of the U.N. resolutions: 1) forcing unconditional Iraqi withdrawal from Kuwait; 2) reestablishing a legitimate Kuwait government; 3) ensuring regional stability and security; and, 4) protecting American and Allied Coalition lives.<sup>16</sup> To achieve any of these aims, President Bush's first priority was the establishment of a powerful, multi-national armed force in Saudi Arabia. The U.S. and Coalition strategy that evolved had three basic elements:

1) Although Coalition leader, the U.S. would keep a low profile by orchestrating all actions in the name of the U.N. Further, as many nations as possible would join the U.S. and British troops in Saudi Arabia.

2) While U.S. military forces had the power to confront and fight Hussein's aggression, many powerful economic nations would benefit from the results, and would suffer from Iraqi control of the world's oil supply. Therefore, the financial burden of the Gulf Conflict would be shared by all involved nations.

3) The solidarity of the Arab world against Iraq must be maintained. Saddam Hussein would attempt to challenge the Arab states' unification by casting doubts on U.S. intentions and by linking Iraqi withdrawal from Kuwait, with Israeli withdrawal from occupied Arab territories, and Syrian withdrawal from Lebanon. These tactics must not be allowed to break Arab resolve against Iraq.<sup>17</sup>

**Military Leadership and Strengths.** The background and experience of the military leaders, and their understanding of the concepts of military doctrine and strategy, influenced the selection of military strategies as well as the effectiveness of employment. Saddam Hussein held the rank of field marshal, but he had never been a notable soldier or a student of military history.

He believed that the war against the Coalition would replicate the Iran-Iraq War, and that he could fight and win using the same strategy. Saddam believed that Coalition troops would never bomb his nation into submission. His strategy was to draw them into a costly land battle, which he believed he could win. He relied on a three-tiered defense: the poorest or least specialized troops were dug in along the Kuwaiti border; the mechanized forces were held in reserve; and the elite Republican Guard was behind them.<sup>18</sup> In a stinging assessment of Saddam Hussein's military acumen, General H. Norman Schwarzkopf, then CINCCENT, said of him, "He is neither a strategist... nor is he a tactician, nor is he a general, nor is he a soldier."<sup>19</sup>

Iraq's warfighting doctrine was the one learned from its eight year battle with Iran; its plan was to apply the same strategy that had succeeded against Iran in its battle with Coalition forces. Key to this doctrine was the non-offensive hunkering down strategy. Iraq's war machine was driven by a massive, war-hardened, experienced Army. During the last decade Iraq had invested heavily in air defenses so that the army could function even if the country lost control of the air. In addition, Iraq had built hundreds of hardened aircraft shelters. These provided the means to preserve Iraq's aerial capacity in the face of a superior enemy for use in the planned land war offensive which would follow. Iraq relied on its medium-range ballistic missiles to attack enemy locations and to extend the war to Israel and Saudi Arabia without having to rely on an air force. Hussein's warfighting strategy also included the threat of use of biological and chemical weapons.<sup>20</sup> While it was not clear to what extent Iraq's nuclear program had progressed towards fielding nuclear weapons, defense analysts agreed that even if nuclear weapons were available Hussein would not have used them because of the risk of retaliation.

The two top military leaders of Operations Desert Shield and Desert Storm, General Colin L. Powell and General Schwarzkopf, were career Army Officers who had seen and studied much military action. The phased Gulf War campaign plan they were to oversee relied on the Army AirLand Battle Doctrine as the final phase of the Gulf Conflict. However, the plan first relied on airpower and air supremacy, and in particular strategic targeting, air interdiction, and battlefield preparation and isolation, to assure the success of the ground campaign which would follow.

To counter the massive Iraqi army's strategy of attrition, the Coalition would employ its own massive and overwhelming force, in a strategy of annihilation. Central to the Coalition campaign strategy was the warfighting notion of "center of gravity" - the points against which all energies should be directed to disrupt and destroy the opponent. The air campaign was structured around the objectives of control of the air, destruction of enemy forces and destruction of Iraqi will to resist. This would not be accomplished by indiscriminate attacks on population centers, but rather, through careful selection of strategic enemy force, industrial, and economic targets. The air campaign plan emphasized achieving theater-wide air superiority to avoid placing air forces in a high-risk defensive posture.

The Campaign would not rely on airpower alone to achieve superiority; land and sea forces also would make significant contributions to gaining and holding air superiority, notably in attacking Iraqi air radar and air defense systems. In addition, Army AirLand Battle Doctrine, with the air forces playing the support roles of interdiction and close air support, was a critical element of the warfighting doctrine which shaped the overall campaign plan.<sup>21</sup>

**Technology and Manpower.** Available technology, as well as manpower, weapon systems, and support resources, significantly influenced the strategies employed by both sides in the Gulf War. There is some disparity in reports regarding the types and magnitude of forces used, as documented in various historical accounts; however, it is clear that massive forces were brought to the region. Table 1 summarizes the contributions of the 40 nations participating as part of the Allied Coalition. Additional NATO forces from the Netherlands, Belgium, Luxembourg, and Germany were also deployed to bases in Incirlik, Turkey as part of Joint Task Force Proven Force, to participate in strategic targeting in northern Iraq and to defend the region against possible Iraqi attack.<sup>22</sup> Table 2 summarizes the strengths of the armed forces of the principal countries involved in the Gulf Conflict. Tables 3 and 4 summarize airpower in use, and Tables 5, 6, and 7 summarize munitions and missiles employed during the conflict.

While Iraq did initiate limited offensives at the outset of conflict, for the most part its forces avoided direct combat. Iraq had in place a sophisticated defensive shield to protect its forces. Its overall attrition strategy relied on the survivability of its 24 very large, heavily fortified main operating bases and 30 major dispersal airfields, and nearly 600 hardened aircraft shelters.<sup>23</sup> Protecting these was a formidable, integrated, state-of-the-art, surface-to-air defense system, employing 350 interceptor aircraft (including 116 French Mirage F-1s), 7000 surface-to-air missiles (SAMs), and 6000 anti-aircraft artillery (AAA) pieces. In addition, the Republican Guard operated independent defensive systems to protect key sites. Key components of the integrated system of fighters, missiles, and anti-aircraft guns were centrally controlled, to provide flexibility and adaptability of application.<sup>24</sup>

Iraq's Air Force, the largest in the Middle East and the sixth largest in the world, was equipped with the most modern French and Soviet combat aircraft. The force included more than 600 combat aircraft, including MiG-25 and -29 fighters and Su-24 and -25 bombers. However, Iraqi pilots were not skilled in maneuverability or offensive performance. They avoided air-to-air combat, and they preferred safety to accuracy, as evidenced by their history of inaccurate bombing from long distances and great altitudes.<sup>25</sup> They also had a force of French and Soviet modern attack helicopters.

Iraq's vast ground war machine - an armored force estimated at one million men plus an elite Republican Guard of eight divisions, and 5000 battle tanks - was designed for land battle. Iraq's arsenal of Soviet ballistic missiles - upgraded for range and accuracy - and its NBC weapons, made up a formidable land-based opponent. Their tanks included modern T-72s with a powerful 125 mm gun, and 6000 armored personnel carriers. Artillery included Soviet-made multiple rocket launchers and South African G5 howitzers, with a range of 24 miles.<sup>26</sup> Iraq had gained a reputation for skilled use of artillery based on performance in the war with Iran.<sup>27</sup>

Just as the Iraqis relied on their strength - their massive experienced army - to bring the victory in a land battle, so too, the Coalition's strategies exploited its strengths. As shown in Tables 1, 2, and 4, the Allied Coalition was prepared to employ massive and overwhelming force to counter the Iraqi strategy. Despite private, impatient urgings of the Israeli and Arab Allies, the Coalition Commander was determined to assure the buildup of that mighty force - sufficient for both defensive and offensive strategies - before launching a land war.<sup>28</sup> Although they were outnumbered in troop size in the region, the Coalition's high-technology weapon systems, their

expertise in the application of those tools, and their knowledge of war planning, military strategy, and military maneuvers, would be their source of superiority.

The Department of Defense (DoD) had been severely criticized during the previous decade for its costly investment in complex, high-technology weaponry; but it was the availability and performance capabilities of those weapon systems that allowed the planning and execution of warfighting as it had never been accomplished before. Plans called for the use of what General Powell, then Chairman of the Joint Chiefs of Staff, referred to as "every tool in the tool box" in initial attacks to defeat enemy air defenses, bombard strategic targets, and obtain air superiority, and to prevent Iraqi ground troops from moving southward.<sup>29</sup> Capabilities included the use of the Airborne Warning and Control System (AWACS), integrated electronic warfare (EW) technology, night vision devices, radar jamming and radar seeking devices, Stealth, Joint Surveillance and Target Attack Radar Systems (JSTARS), Global Positioning System (GPS), precision guided munitions (PGM), medium and long-range unmanned cruise missiles, and the Patriot ballistic missile defense system.<sup>30</sup>

Increased performance, reliability, maintainability, and accuracy of weapon systems all allowed the Coalition to plan to fight a "twenty first century hyperwar."<sup>31</sup> In the words of retired General Michael H. Dugan, former USAF Chief of Staff: "Technology has caught up with doctrine" allowing a new kind of warfare: hyperwar, distinguished by high tempo, round-the-clock operations, surprise, ...precision bombing, and increased aircraft survivability.<sup>32</sup> General Powell described in basic terms how high-technology weaponry used in the four-phased Gulf War strategy would assure Coalition defeat of the Iraqi military: "First we are going to cut it off,

then we are going to kill it.” This would be accomplished by obtaining first air superiority, and then air supremacy.<sup>33</sup>

**Role of Airpower.** Airpower played a very limited role in Iraqi warfighting during the Gulf Conflict. U.S. officials described Saddam Hussein’s military strategy in Desert Storm as “hunkering down.” Practically no Iraqi planes were sent into battle; rather, they were kept in their bunkers. Instead of taking the offensive and aggressively meeting Allied forces, the Iraqi Air Force absorbed the blows of the enemy, awaiting the Coalition launch of a ground attack. Saddam’s approach was one of waiting out the initial siege and then undertaking a strategy of attrition. This was where Iraqi experience and strength rested; dug in as they were, they would be able to respond well to a ground attack and deal the Coalition forces heavy casualties. This, in turn, would move the American public to pressure Washington to reach a quick, negotiated settlement.<sup>34</sup>

Airpower was to play the key role in the Coalition warfighting strategy in the Gulf Conflict. In June 1990, just two months prior to the Iraqi invasion of Kuwait, the Air Force issued a White Paper entitled “The Air Force and National Security: Global Reach - Global Power.” This White Paper enunciated a framework for the Air Force contribution to national security via airpower. It served as a strategic planning document, and emphasized the advantage airpower offers (over land or sea power) in terms of airpower’s ability to reach anywhere on the globe within hours, with decisive military force, because of five unique characteristics inherent with modern airpower: speed, range, flexibility, precision, and lethality.<sup>35</sup>

The document constituted a thoughtful, reasoned approach to the use of military force and presence in the post-Cold War period. It recognized the growing threat to international order and



stability Iraq presented in the Middle East, and addressed the use of air forces in this and other crisis areas around the world. It warned that "In the Persian Gulf, our objectives will remain to support friendly states and prevent hostile power - any hostile power, not necessarily the Soviet Union - from gaining control over the region's oil supplies and lines of communication."<sup>36</sup> History has since shown that this vision of conflict and the role of airpower was correct; it accurately predicted what was to occur in the Persian Gulf, in Operations Desert Shield and Desert Storm.

Aerospace Doctrine provided the basis for warfighting planning in Desert Storm, with airpower taking a lead role in the four-phased Coalition Plan which would serve as the military roadmap for Desert Storm. In the spring of 1990 CENTCOM staff officers had developed a draft new USCINCCENT Operations Plan (OPlan) 1002-90, Defense of the Arabian Peninsula. In July 1990 this draft OPlan for defense of Southwest Asia was examined by Central Command leaders during Internal Look 90, a command post exercise, which ended just days before the Iraqi invasion of Kuwait.<sup>37</sup>

USAF Lieutenant General Charles A. Horner, Commander, Air Force Component, Central Command (CENTAF, CENTCOM) was designated the Air Defense Commander, the Airspace Control Authority and the Joint Forces Air Combat Commander (JFACC), responsible for planning, coordinating, allocating, and tasking theater air operations for Operations Desert Shield and Desert Storm. He appointed (then) USAF Brigadier General Buster C. Glosson as director of a special planning group, nicknamed the Black Hole, responsible for planning the offensive air operations.<sup>38</sup>

***Four-phased campaign plan.*** Working in secrecy, Black Hole planners drew on a strategic air war concept called Instant Thunder, which had been developed in August 1990 by Colonel John A. Warden III, the Air Staff Deputy Director for Warfighting, and an Air Staff division known as Checkmate. Within weeks the Black Hole team had developed a four-phased plan for an air and ground campaign. Led by General Glosson and his principal deputy for planning attacks against strategic targets, (then) Lieutenant Colonel David A. Deptula, they developed a comprehensive offensive strategy for immobilizing and defeating the Iraqi war machine.<sup>39</sup> The plan focused on the systematic use of airpower to cripple categories of selected priority target sets via strategic bombing, to gain control of Kuwaiti skies through suppression of Iraqi air defenses, and to weaken the Iraqi occupying forces by bombing Iraqi artillery positions, trench lines, and troops, in preparation for launching a concentrated ground attack.<sup>40</sup>

In August 1990 a U.S. - Saudi Joint Directorate of Planning (JDOP) was established at the Saudi Ministry of Defense in Riyadh, to develop combined operations plans for the conflict. In December 1990 the Black Hole planners were formally merged with the CENTAF planning staff, and all phases of the air campaign came together in the Desert Storm Operations Plan.<sup>41</sup>

***Two air wars.*** The U.S. and Coalition strategy for the conduct of the Gulf War depended upon the exercise of two distinct air wars: one during the air campaign and one during the ground campaign. The first air war - the air campaign - employed basic Aerospace Doctrine. It centered on the goal of achieving air superiority, and it effectively used all the capabilities of airpower: aerospace control, force application, force enhancement, and force support. The second air war - the ground campaign - called for the exercise of AirLand Battle Doctrine. It

Doctrine. It centered on the goal of driving Iraqi troops from Kuwait, and it effectively used airpower in support of ground forces via air interdiction and close air support.<sup>42</sup>

**Joint operations.** The Desert Storm campaign plan called for an integrated, joint and combined operation involving sea, air, and land forces.<sup>43</sup> In an assessment of the campaign strategy following the Gulf War, General Horner observed that Desert Storm strategy “...emphasized the role of airpower because of the...nature of the war. It did not make airpower the only element or the supreme element, but it did emphasize the contribution of airpower.”<sup>44</sup>

The Gulf War campaign provided the opportunity to demonstrate the full range of unique airpower capabilities, as defined in the recently developed “Global Reach - Global Power” White Paper. The air forces would: “...project power rapidly over great distances, employ airlift for reinforcement and resupply, use airborne and spaceborne platforms for command, control, communications, and intelligence, hit critical targets in the first hours of conflict, establish control of the air, reduce the enemy’s force and his means to make war, and ultimately ensure a favorable ratio for the ground forces at the point of contact.”<sup>45</sup>

**Ground offensive.** The ground campaign, a bold offensive designed to defeat unequivocally the Iraqi forces occupying Kuwait, involved “...the largest maneuver of armor in the desert in U.S. military history.” The plan called for holding the occupying forces in place “...with a frontal attack while sending an even bigger army to outflank it, envelop it, and crush it against the sea.” It relied on a massive Coalition ground force to traverse hundreds of miles of unguarded desert, and complete a “left hook” along the western flank of the army in Kuwait and envelop the enemy. The planned four-pronged ground assault attack included: U.S. Marines and a Saudi Task Force moving across the border and north toward Kuwait City; a second parallel

attack in the western part of Kuwait by pan-Arab forces: U.S. Army forces from the west to block the Republican Guard route of retreat: and, a Coalition flank attack from the west. The plan used AirLand Battle Doctrine involving ground forces supported by air interdiction and close air support forces.<sup>46</sup>

**Table 1. Allied Forces in the Gulf Theater<sup>47</sup>**

<b>Afghanistan</b>	300 mujahedin troops
<b>Argentina</b>	1 destroyer, 1 corvette, 2 air force transport planes
<b>Australia</b>	1 guided-missile destroyer, 1 frigate, 1 supply ship, 2 surgical teams
<b>Bahrain</b>	3,000 troops
<b>Bangladesh</b>	6,000 troops
<b>Belgium</b>	1 frigate, 2 minesweepers, 2 landing ships, 1 supply ship, 6 C-130 transport planes
<b>Britain</b>	43,000 troops, 6 destroyers, 4 frigates, 3 minesweepers, 5 support ships, 168 tanks, 300 armored vehicles, 70 Tornado and Jaguar combat jets
<b>Canada</b>	2 destroyers, 1 supply ship, 12 C-130 transport planes, 24 CF-18 bombers
<b>Czechoslovakia</b>	200 chemical-warfare specialists
<b>Denmark</b>	1 corvette
<b>Egypt</b>	40,000 troops, including 2 armored divisions and 5,000 Special Forces paratroopers
<b>France</b>	18,000 troops, 60 combat aircraft, 120 helicopters, 40 tanks, 100 armored vehicles, 1 missile cruiser, 3 destroyers, 4 frigates
<b>Greece</b>	1 frigate
<b>Honduras</b>	150 troops
<b>Hungary</b>	40 medical personnel
<b>Italy</b>	2 corvettes, 3 frigates, 1 supply ship, 4 minesweepers, 10 Tornado ground attack aircraft
<b>Japan</b>	medical personnel and supplies
<b>Kuwait</b>	11,000 troops
<b>Morocco</b>	1,700 troops
<b>Netherlands</b>	2 frigates, 1 supply ship
<b>New Zealand</b>	3 C-130 Hercules transport planes, 1 medical team

**Table 1. Allied Forces in the Gulf Theater (continued)**

<b>Niger</b>	500 troops
<b>Norway</b>	1 Coast Guard cutter, 1 transport ship
<b>Oman</b>	25,000 troops, 63 airplanes, 4 Exocet-armed ships
<b>Pakistan</b>	7,000 troops
<b>Philippines</b>	medical personnel
<b>Poland</b>	2 rescue ships
<b>Portugal</b>	1 naval logistics ship
<b>Qatar</b>	1 squadron of Mirage F-1E fighter planes
<b>Romania</b>	360 medical personnel, 180 chemical warfare experts
<b>Saudi Arabia</b>	118,000 troops, 550 tanks, 180 combat planes, 8 frigates
<b>Senegal</b>	500 troops
<b>Sierra Leone</b>	30 medical personnel
<b>Singapore</b>	35-man medical team
<b>South Korea</b>	5 C-130 Hercules transport planes, 150-man medical team
<b>Spain</b>	1 frigate, 2 corvettes, 1 supply ship, 1 C-130 transport plane
<b>Sweden</b>	field hospital and medical personnel
<b>Syria</b>	17,000 troops, 300 T-62 tanks
<b>United Arab Emirates</b>	40,000 troops, 80 combat planes, 15 ships, 200 tanks
<b>United States</b>	540,000 troops, 6 aircraft carriers, nuclear submarines, 2,000 tanks, 2,200 armored personnel carriers, 1,700 helicopters, 100 warships, 1,800 airplanes

**Table 2. Armed Forces of Kuwait, Saudi Arabia, and United States: 1990<sup>48</sup>**

*Note: There is considerable disagreement concerning force numbers. This table is taken from Dilip Hiro's Desert Shield to Desert Storm: The Second Gulf War, Routledge, Chapman, and Hall, 1992.*

Country:	<u>Iraq</u>	<u>Kuwait</u>	<u>Saudi Arabia</u>	<u>United States</u>
<b>Total Regular Armed Forces</b>				
Active	1,000,000	20,300	67,800	2,117,900
Reserves	-	-	-	1,819,300
<b>Ground Forces</b>				
Regular Army				
Active	955,000	16,000	40,000	761,100
Reserves	-	-	-	1,043,000
Para-military				
Active	250,000	10,500	7,000	-
Reserves	600,000	-	-	-
In Service Equipment				
Battle Tanks	5,500	245	550	15,440
Armed Combat Vehicle	7,500	445	1,600	31,435
Major Artillery	3,500	72	475	5,725
Combat Helicopters	159	-	-	1,612
Aircraft	-	-	-	696
<b>Air Forces</b>				
Regular Air Force	40,000	2,200	22,000	571,000
In Service Equipment				
Combat Aircraft	689	35	189	3,921
Combat Helicopters	-	18	-	-
<b>Naval Forces</b>				
Regular Navy	5,000	2,100	9,500	590,500
In Service Equipment				
Surface Combatants *	5	-	8	220
Patrol/Coastal Combat	38	23	12	30
Mine Welfare Vessels	8	-	5	29
<b>Marine Forces</b>				
Regular Marine Corps	-	-	1,500	195,300
In Service Equipment				
Battle Tanks	-	-	-	716
Arm Combat Vehicle	-	-	140	2,025
Major Artillery	-	-	-	1,054

\* Aircraft Carriers, Cruisers, Destroyers, and Frigates

**Table 3. Iraqi Air Orders of Battle<sup>49</sup>**

*Note: There is considerable disagreement concerning Iraq's aircraft inventory. This table is based on International Institute of Strategic Studies, The Military Balance, 1990-1991, and other sources.*

**Bombers:** 8 Tu-22s, 4 Tu-16, and 4 H-6 (Chinese Tu-16)

**Fighters/FGA/Reconnaissance:** 30 J-6 (Chinese MiG-19), 40 J-7 (Chinese MiG-21), 30 MiG-29, 32 MiG-25, 90 MiG-23, 155 MiG-21, 64 Mirage EQ5/-2000, 30 Mirage F-1, 30 Su-7, 70 Su-20, 16 Su-24, and 60 Su-25

**Airborne Early Warning:** 2 Il-76

**Tankers:** 1 Il-76

**Transports:** 10 An-2, 10 An-12, 6 An-24, 2 An-26, and 19 Il-76

**Training:** 35 AS-202, 88 EMB-312, 50 L-29, 40 L-39, 16 MB-233, 16 Mirage F-1, 50 PC-7, 30 PC-9/Su-7B, 2 Tu-22, and 10 Yak-11



**Table 4. Coalition Air Orders of Battle<sup>50</sup>**

Combat Aircraft strength by aircraft type:

<u>Type:</u>	<u>Number:</u>
A-4	18
A-6E	110
A-7E	24
A-10	144
AV-8B	60
B-52G	45
Buccaneer	12
CF-18	24
EA-6B	42
E-2C	30
F-4G	48
F-5	97
F-14	100
F-15	42
F-15C	120
F-15E	48
F-16	261
F-111E/F	82
F-111	18
F-117	42
F/A-18	190
Jaguar	68
Mirage	68
RF-4C	24
Tornado	103
Total	1,820

Table 5. Selected Munitions Employed, 17 Jan - 28 Feb 1991 \*<sup>51</sup>

Munitions	Air Force	Navy	Marine Corps	Total
<hr/>				
<b>General-Purpose Bombs</b>				
Mk-82 (500 lb)	59,884	10,941	6,828	77,653
MK-83 (1000 lb)		10,125	8,893	19,081
Mk-84 (2000 lb)	10,467	971	751	12,289
Mk-117 (B-52)	43,435			43,435
CBU-52 (fragmentation bomb)	17,831			17,831
CBU-87 (combined effects munition)	10,035			10,035
CBU-89/78 (Gator)	1,105	148	61	1,314
Mk-20 (Rockeye)	5,345	6,814	15,828	27,987
<hr/>				
<b>Laser-Guided Bombs</b>				
GBU-12 (laser/Mk-82)	4,086	205	202	4,493
<hr/>				
<b>Air-to-Surface Missiles</b>				
**AGM-114 Hellfire (AH-64 & AH-1W)	Army = 2,876	30	159	3,065
AGM-65 All Models (Maverick)	5,255		41	5,296
<hr/>				

\* Selected munitions were those most often employed in KTO; others were used in war, but not principally in KTO. Totals are those employed on all targets, not just KTO.

\*\* Navy and Marine Corps also fired a total of 283 BGM-71 TOW munitions from helicopters.

**Table 6. Weapons Expenditures (and % of Total U.S. Expenditure)<sup>52</sup>**

<b>Munition types:</b>	<b>Guided bombs, all types</b>	<b>Anti-radiation missiles (principally HARMs)</b>	<b>Air-to surface missiles (Maverick for AF; principally Walleye for N, MC)</b>
<b>Air Force</b>	8,456 (90%)	1,120 (55%)	5,255 (96%)
<b>Navy</b>	623 (7%)	679 (33%)	147 (3%)
<b>Marine Corps</b>	263 (3%)	240 (12%)	46 (1%)
<b>Totals</b>	9,342 (100%)	2,039 (100%)	5,448 (100%)
<b>Royal Air Force (UK)</b>	1,126	112 *	N/A
<b>French Air Force</b>	N/A	N/A	approx 60 **
<b>Grand Totals</b>	10,468 (U.S. 89%)	2,151 (U.S. 95%)	5,508 (U.S. 99%)

\* *Air-Launched Anti-radiation Missiles (ALARMs)*

\*\* *AS-30s (laser-guided missiles)*

**Table 7. Missiles Employed in Desert Storm Strikes<sup>53</sup>**

<b>Organization</b>	<b>Type</b>	<b>Number launched</b>
<b>U.S. Navy</b>	Tactical Land Attack Missile (TLAM)	282 (last one launched on 1 Feb)
<b>U.S. Army</b>	Army Tactical Missile System (ATACMS)*	21 missions (some missions had two missiles employed)
<b>U.S. Air Force</b>	Conventional Air-Launched Cruise Missile (CALCM)	35 (all launched first day of air war)

*\* The ATACMS is included here given its range of over 50 miles, which sets it apart from other rocket systems and naval gunfire.*

**Assessment Based on the Application of the Principles of War.**

*The Principles of War serve as a useful analytical framework for assessing the successes and failures of the opposing forces during the Gulf War.*

**Analytical Framework.** The Principles of War were adopted by the U.S. Army in 1921, and subsequently included in USAF Aerospace Doctrine. They are presented in AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, as guidelines which help provide a better understanding of warfare, for use in the formulation and selection of courses of action. The Principles of War are the basis for the understanding and mastery of warfare and the military methods used as the instrument of power during hostilities.<sup>54</sup>

**Analysis of Application of Principles.** An analysis of Iraqi air strategy employed during the Persian Gulf War is very limited, since their strategy used limited airpower. The Iraqi forces failed to exercise any perceivable strategy in the use of their air force. Some observations can be made, however, regarding the overall Iraqi military conduct, relative to the application of the Principles of War.

In contrast, an analysis of the Allied Coalition strategy provides numerous insights into the value of airpower, and the exercise of the Principles of War in both air and land operations.

Coalition forces followed USAF's Aerospace Doctrine in their conduct of the Air Campaign, and the U.S. Army's AirLand Battle Doctrine during the 100 hour Ground Campaign. Analysis also underscores differences between operational plans, immediate results as viewed during the course of conflict, and long-term results observed following the campaign.

***Principle of Objective:*** "Direct military operations toward a defined and attainable objective that contributes to strategic, operational, or tactical aims."<sup>55</sup>

*Iraqi application of the principle of Objective.* Saddam Hussein did not focus on a clear military objective that would bring about a victory against the Coalition. His poor understanding of military affairs and his subordination of military strategy to the ultimate goal of protecting his regime, drove him to fight with at least one eye set on his post-war survival. He held back key units, was cautious, took little initiative, and failed to use effectively his air force or his Republican Guard elite force. He failed to understand the decisive role airpower played in modern warfare, and mistakenly believed that Iraq's defensive posture would ultimately result in defeat of the enemy.<sup>56</sup>

Ironically, as a result of his failure to deploy effectively his forces and his concern about the posture of his forces following the war, Saddam lost the war but is still in power today, and remains a threatening force in the region.

*Allied Coalition application of the principle of Objective.* The Joint Forces had five specific air campaign objectives: 1) isolate and incapacitate the Iraqi regime; 2) gain and maintain air supremacy to permit unhindered air operations; 3) destroy nuclear, biological, and chemical warfare capability; 4) eliminate Iraq's offensive military capability: major parts of key military production, infrastructure, and power projection; and, 5) render the

Iraqi army and mechanized equipment ineffective. Specific strategic target sets to achieve those objectives, which were identified and evolved during the course of operational planning, are summarized in Table 8.<sup>57</sup>

Overly optimistic assessments of tactical reconnaissance and intelligence information on battle damage and mission performance data throughout the Gulf War led to erroneous conclusions regarding the extent of achievement of these objectives. While some of Iraq's military capabilities were rendered ineffective short-term, analysis following the war indicates that mission performance fell short of targeted objectives. Table 9 contrasts planned vs. actual results for categories of target sets. From a long-term perspective, the Iraqi regime was not incapacitated, NBC warfare capability was not destroyed, and Iraq's offensive military capability was not eliminated.

***Principle of Offensive:*** "Act rather than react and dictate the time, place, purpose, scope, intensity, and pace of operations. The initiative must be seized, retained, and fully exploited."<sup>58</sup>

*Iraqi application of the principle of Offensive.* Iraq initiated extremely limited offensives during the Gulf Conflict. The Iraqi armed war was limited to anti-aircraft fire, the firing of Scud missiles against Israel and Saudi Arabia, and a single offensive ground attack at Al Khafji. There were no deep-penetration aircraft strikes, no mass attacks by the surviving Iraqi aircraft during the opening phases of the ground offensive, no successful missions against Allied naval vessels, and no verified use of chemical weapons. The Iraqi air force made no serious attempt to interfere with the Allied bombing raids, and failed to attack Allied naval

vessels, or to slow down the ground defensive. The Iraqi navy was half-destroyed, and the army offered no meaningful resistance.<sup>59</sup>

*Allied Coalition application of the principle of Offensive.* The planned four-phased Allied Coalition campaign consisted of three simultaneous or overlapping air offensive phases followed by a ground offensive. The first phase was designed to eliminate the Iraqi offensive capabilities and incapacitate the Command, Control, and Communications structure. Simultaneously, airpower would destroy the Iraqi air forces, the integrated air defense system (IADS), and NBC facilities. The second phase focused on the Iraqi supply and munitions bases, transportation facilities, and roads. The third phase involved air attack missions against Iraqi troops and ground emplacements.<sup>60</sup> Actual execution of the planned campaign saw the simultaneous unfolding of the first three distinct phases; strikes against leadership and command, control, communications targets, air defense system targets, and ground forces targets.

While the Coalition enjoyed unprecedented success in the overall air campaign, they experienced significant difficulties in intelligence support, particularly tactical intelligence in the form of target imagery and reliable data on mission performance and battle damage assessment.<sup>61</sup> Military analyst Tamir Eshel observed that “Battle Damage Assessment (BDA) was sorely lacking during this campaign. Many targets had to be re-attacked, where initial reports confirmed direct hits: but as satellite photos were received and recce flights came back...the targets were shown intact or only slightly damaged.”<sup>62</sup>

*Principle of Mass:* “Concentrate combat power at the decisive time and place.”<sup>63</sup>

*Iraqi application of the principle of Mass.* The Iraqi forces planned to use an offensive technique perfected late in the Iran-Iraq War, in which they applied overwhelming



firepower, outnumbering the enemy by as much as twelve to one. attacking the weakest point in the enemy defensive line. However, they were unable to draw the Coalition into an early land operation where they could use their numerical advantage.<sup>64</sup>

*Allied Coalition application of the principle of Mass.* Armed with U.N. Security Council Resolution 678, as well as favorable Congressional authorization to use military force against Iraq, President Bush assured the deployment of sufficient forces to the Gulf, to launch a strategic offensive. Once those forces were amassed, they were judiciously managed and employed to accomplish the strategic objectives.<sup>65</sup>

By the start of the war more than a half a million Americans had deployed to the Gulf. More than 3000 fixed-wing aircraft were deployed by Coalition forces to the Gulf and elsewhere. The full weight of the Coalition air forces was used from the opening strikes of the Gulf War air campaign. In the first night more than 1000 sorties were flown, and this grew to more than 2500 sorties per day for 43 days, delivering an enormous arsenal of "dumb bombs", as well as high-technology weaponry and munitions. More than 80,000 air sorties were flown against Iraq in the first five weeks, and 88,500 tons of bombs were dropped over targets.<sup>66</sup> Mass was used at the peak of the land battle as well; U.S. forces in the Kuwaiti Theater of Operations (KTO) numbered 540,000, and other Coalition forces contributed 205,000 soldiers, sailors, and airmen.<sup>67</sup>

*Principle of Economy of Force:* "Create usable mass by using minimum combat power on secondary objectives. Make fullest use of [judicious management of] all forces available."<sup>68</sup>

*Iraqi application of the principle of Economy of Force.* Iraq did segregate its forces into regular army, reserve forces, and elite forces. However, without a clear strategy and objectives this does not appear to have been motivated by a utilization of the principle of economy of force, or to have influenced their operational tactics. Iraq did prove to be “adept at deception and camouflage,”<sup>69</sup> contributing to Saddam Hussein’s ability to judiciously manage his forces and infrastructure for post-war survival.

*Allied Coalition application of the principle of Economy of Force.* In an analysis of the strategies employed in Desert Storm, Colonel Harry G. Summers, Jr., U.S. Army (Retired) stated “Revitalization of the principles of mass, economy of force, and maneuver at the strategic level enables their reemphasis at the operational and tactical levels.” He cited the remarkable accomplishments in strategic mobility and logistics, before and during Desert Storm. That achievement in mass, economy of force, and maneuver was matched at the operational level at the outset of the Ground Campaign.<sup>70</sup> The frontal movements into Kuwait were only a secondary effort; the primary effort, which was key to a quick, decisive final victory, was directed further to the west of the Saudi-Iraqi border. There the main army and its logistical support had been assembled, to carry out a massive, two-pronged “left hook” maneuver that would trap Iraqi forces and lead to surrender.<sup>71</sup>

Military analyst and author David Eshel said “The ground phase of Desert Storm...had not only achieved all of its objectives after only 100 hours, but it had also reduced Saddam Hussein’s military juggernaut to a routed mob.” He cited a “brilliant military operation ...executed with precision... [in] what initially seemed to be the most difficult circumstances in modern history.”<sup>72</sup> U.S. leaders believed the objectives had been achieved and Iraq no longer

represented a threat to the region. However, post-war investigations would reveal that Iraq's offensive military capabilities had not been destroyed, and remained a threat to regional security.

***Principle of Maneuver:*** "Place the enemy in a position of disadvantage through the flexible application of combat power."<sup>73</sup>

*Iraqi application of the principle of Maneuver.* Attacking Iraqi troops did have experience in maneuver, using four attack formations: wedge, echelon, line, and diamond. The wedge was an arrowhead formed by tanks and armored carriers, while the echelon was a one-sided arrow. The line was the final assault formation, while the diamond was used when space limited movement. They could vary their approach to the attack line depending on the terrain and the nature of the enemy defense. Artillery support was always coordinated for the attacks, but rigid time schedules were difficult to alter rapidly. In the sole offensive initiated by Iraq during the conflict, the Iraqis executed the ambush poorly using the wrong formation, and caught themselves in their own line of fire, killing an officer.<sup>74</sup>

*Allied Coalition application of the principle of Maneuver.* AirLand Battle Doctrine emphasizes maneuver warfare, agility, and synchronization of forces. The ground offensive was a complex and multi-dimensional operation. At its heart was a deep flanking maneuver west of the Kuwaiti border into Iraq, aimed at destroying the Republican Guard, cutting off critical locations, and channeling withdrawing troops into a large killing zone. The attack was supported by ground, naval, and air attacks in the KTO, to fool the Iraqis into believing that the main thrust was in the East.<sup>75</sup> The bold flanking maneuver was a "brilliant scheme of maneuver" allowing "forces to finish the war quickly with minimum loss of life."<sup>76</sup>

***Principle of Unity of Command:*** “Ensure unity of effort for every objective under one responsible commander.”<sup>77</sup>

*Iraqi application of the principle of Unity of Command.* Saddam Hussein was both the political and the military leader of Iraq, and all commands came directly from him. Once he issued an order, his subordinate commanders developed a concept of operations and detailed orders, which then required headquarters approval. Thus the Iraqi Command, Control, and Communications (C3) capability was critical to all military operations.<sup>78</sup>

*Allied Coalition application of the principle of Unity of Command.* U.S. Central Command headquarters is at MacDill AFB in Florida; General Schwarzkopf established a forward headquarters in Riyadh for Command and Control of the multi-national Coalition. He commanded both the administrative and operational chains of command, as shown in Tables 10, 11 and 12, effectively ensuring the necessary unity of command, and coordinating administrative and logistics plans, procedures, and actions.<sup>79</sup>

According to General Schwarzkopf, throughout the Gulf War President Bush refused to second-guess him, but rather, “...allowed the [U.S.] military and the coalition military to fight this war exactly as it should have been fought. The President in every case has taken our guidance and our recommendations to heart and has acted superbly as the Commander-in-Chief of the United States.”<sup>80</sup> Schwarzkopf said that President Bush did not interfere with target selections or operational tactics, and he allowed the military to fight the war as they saw fit.<sup>81</sup> Despite Schwarzkopf’s praise for President Bush, reports indicate that there was considerable guidance from the leadership in Washington regarding details of waging the war; from escalating pursuit of Scud missile launchers, to restricting bombing and selection of targets in Baghdad

after the attack on the Al Firdos bunker in which hundreds of Iraqi civilians were killed, to the timing for initiation and termination of the ground war.<sup>82</sup>

Analysis shows that the principal political leaders and advisors, as well as all of Schwarzkopf's field commanders, unanimously concurred with the decision to terminate hostilities.<sup>83</sup> The decision was based on the belief that the four principal objectives, which had guided actions since the outset of the war, had been achieved: 1) Iraq had unconditionally withdrawn from Kuwait; 2) the Kuwait government was reestablished; 3) regional stability and security was restored; and, 4) American and Allied Coalition lives were safe. General Schwarzkopf explained "...There was no question about the fact that the campaign objectives that we established for ourselves were accomplished. The enemy was being kicked out of Kuwait...we had destroyed that Republican Guard as an effective fighting force."<sup>84</sup> While at the time U.S. leaders believed the objectives had been achieved, post-war findings challenged those successes; Republican Guard personnel and equipment attrition was less than 50%, posing a continuing threat to regional security.

***Principle of Security:*** "Protect friendly forces and their operations from enemy actions which could provide the enemy with unexpected advantage."<sup>85</sup>

*Iraqi application of the principle of Security.* Saddam Hussein failed to initiate actions to provide for security of his forces, or to hinder the buildup of Coalition forces. He made no missile strikes against debarkation ports, and no air attacks against concentration of planes, equipment, and troops. Rather, his "...army sat entrenched in Kuwait as if some invisible channel separated it from Allied units to the south."<sup>86</sup>

*Allied Coalition application of the principle of Security.* The entire air campaign can be viewed as a strategic effort to assure the security of friendly forces against enemy attacks. Air superiority was essential to the planned massive movements of tanks and supply vehicles that were to accompany the Coalition surprise ground attack. Three days after the war began there was almost no enemy air opposition; the Iraqi air forces refused to fly. Iraqi radar-controlled surface-to-air missiles (SAMs) were knocked out, and Allied aircraft avoided anti-aircraft artillery (AAA) and small arms fire by flying above 10,000 feet. As a result of the massive air assaults Iraqi troops were physically exhausted, their morale was depleted, and most were defeated before the ground advance began.<sup>87</sup>

***Principle of Surprise:*** "Strike the enemy at a time or place or in a manner for which he is unprepared."<sup>88</sup>

*Iraqi application of the principle of Surprise.* Saddam Hussein's initial, swift invasion into Kuwait, which precipitated the Gulf Crisis, as well as his surprise offensive into Al Khafji, showed an awareness of the value of the principle of surprise.

*Allied Coalition application of the principle of Surprise.* The timing of the attack on Iraqi forces at the outset of Desert Storm should have come as no surprise to Saddam; the U.N. had set midnight, 15 January 1991, as the deadline for the withdrawal from Kuwait.<sup>89</sup> Nonetheless, CENTCOM deception helped achieve tactical surprise. A pattern of round-the-clock air activity was established, and the Iraqis were conditioned to the presence of large numbers of AWACS and fighter combat air patrols, with a surge of activity one night each week. In addition, the forces were placed on ground alert, reportedly as a precaution against preemptive Iraqi attack, as part of the deceptive tactics to achieve surprise.<sup>90</sup>

Coalition forces achieved tactical surprise at the outset of the Ground Campaign as well. Iraq expected that Kuwait would be the primary objective, and that the main allied force would approach frontally, where they had built their strongest defense. However, the Coalition forces' main effort was directed towards the western flank of the Iraqi forces.<sup>91</sup>

***Principle of Simplicity:*** "Avoid unnecessary complexity in preparing, planning, and conducting military operations."<sup>92</sup>

*Iraqi application of the principle of Simplicity.* Saddam Hussein's preparation, planning, and conduct of military operations were extremely simplistic. Following the tactic which was successful in the Iran-Iraq War, his plan was to maintain a defensive posture until he could force a ground war, in which his massive, experienced ground forces would defeat the enemy.

*Allied Coalition application of the principle of Simplicity.* Command and Control of strategic and tactical operations of hundreds of thousands of personnel, materiel, and equipment and eleven air forces, during the most massive air campaign ever launched, was not simple; but it was accomplished in a structured, coordinated, and effective manner. The Joint Air Forces Master Attack Plan (MAP), an internal planning document and process, consolidated all inputs into a single, concise plan which set forth the intent for the campaign. Daily, it considered the master strategic target list, changing priorities and political developments, battle damage assessment, weather, enemy movement, and available forces, and developed a sequence of attacks, targets, timing, weapon systems, and support systems required. To execute the MAP an Air Tasking Order (ATO) was developed, integrating critical details such as refueling,

intelligence, logistics, weather, mission identifiers, routes, altitudes, Identification Friend or Foe (IFF), call signs, and related data.<sup>93</sup>

In an insightful analysis of General Schwarzkopf and his leadership role in Operations Desert Shield and Desert Storm, historians Roger Cohen and Claudio Gatti wrote: "...General Schwarzkopf, who had read Sun Tzu, did not invent anything in the Gulf. Schooled in military theory, fascinated by the maneuvers of great generals, he brought the knowledge of ancients to bear on the use of twenty-first century technology...But the key to success lay in Schwarzkopf's inspired use of the classical military precepts he long had studied."<sup>94</sup>



**Table 8. Strategic Air Targets<sup>95 96</sup>**

<b>Target Sets Categories</b>	<b># as of 21 Aug 90</b>	<b># as of 20 Dec 90</b>	<b># as of Desert Storm</b>	<b># Sorties Flown</b>
<b>Strategic air defense</b>	10	27	29	436
<b>Nuclear, chemical biological facilities</b>	8	20	31	902
<b>Leadership, National command authority</b>	5	27	26	429
<b>Command, control, communication sites</b>	19	30	170	601
<b>Electric power</b>	10	16	28	215
<b>Oil facilities</b>	6	8	28	518
<b>Railroads, roads, bridges</b>	3	21	54	712
<b>Airfields</b>	7	25	66	3,047
<b>Naval ports and facilities</b>	1	4	20	247
<b>Military support facilities</b>	15	46	96	2,756
<b>Short range ballistic missiles, Scud facilities</b>	N/A	13	30	2,767
<b>Republican Guards</b>	N/A	0	145	5,646
<b>Totals</b>	<b>84</b>	<b>237</b>	<b>723</b>	<b>18,276</b>

**Table 9. Operational-Strategic Summary<sup>97</sup>**

<b>Target Sets</b>	<b>Desired/Planned Effects</b>	<b>Actual Results</b>
<b>IADS &amp; Airfields</b>	Early air superiority - Suppression medium-high air defenses thruout Iraq - Contain/destroy Iraqi AF	IADS blinded/intimidated/suppressed - Low-altitude AAA, IR SAMs remained Iraqi AF bottled up on bases - 2 air-to-surface Iraqi shooter sorties? 375 of 594 HABs destroyed/damaged - Iraqi AF flees to Iran (starting 25 Jan 91)
<b>Naval</b>	Attain sea control - Permit naval operations in northern Persian Gulf	All Iraqi naval combatants sunk/neutralized - Other vessels sunk Silkworms remained active thruout war
<b>Leadership &amp; Telecomm</b>	Pressure/disrupt governmental functioning Isolate Saddam from Iraqi people, forces in KTO	Unknown degree of disruption - Neither decapitation nor Saddam's overthrow Telecomms substantially reduced - Links to KTO never completely cut - International communications cut
<b>Electricity &amp;</b>	Shut down national grid - Minimize long-term damage	Rapid shutdown of grid - Down 55% by 17 Jan, 88% by 9 Feb - Lights out in Baghdad Some unintended damage to generators
<b>Oil</b>	Cut flow of fuels/lubricants to Iraqi forces - No lasting damage to oil production	Refining capability down 93% (Day 34) Destroyed about 20% of the fuel/lubricants at refineries & major depots - 43 day war precluded long-term effects

**Table 9. Operational-Strategic Summary (continued)**

<b>Target Sets</b>	<b>Desired/Planned Effects</b>	<b>Actual Results</b>
<b>NBC &amp;</b>	Destroy chem/bio weapons <ul style="list-style-type: none"> <li>- Prevent use against Coalition</li> <li>- Destroy production capability</li> </ul>	Some chemical weapons destroyed <ul style="list-style-type: none"> <li>- But most survived (UN Special Comm)</li> <li>- Chemical use deterred</li> <li>- No biological weapons found (UN)</li> </ul>
	Destroy nuclear program <ul style="list-style-type: none"> <li>- Long term</li> </ul>	Nuclear program "inconvenienced" (UN) <ul style="list-style-type: none"> <li>- Most program elements survived</li> </ul>
<b>Scuds</b>	Prevent/suppress use <ul style="list-style-type: none"> <li>- Destroy production &amp; infrastructure</li> <li>- Keep Israel out of the war</li> </ul>	Firings somewhat suppressed, not salvos <ul style="list-style-type: none"> <li>- Scud operations pressured</li> <li>- Aircraft destroyed few, if any, MELs/TELs</li> </ul>
<b>Railroads/Bridges</b>	Cut supply lines to KTO <ul style="list-style-type: none"> <li>- Prevent retreat of Iraqi forces</li> </ul>	All important bridges destroyed <ul style="list-style-type: none"> <li>- Many Iraqi workarounds</li> </ul> Short duration of war limited effects
<b>Republican Guard &amp; Ground Forces in KTO</b>	Destroy the RG Reduce combat effectiveness 50% (armor, artillery) by G-Day	RG immobilized <ul style="list-style-type: none"> <li>- Attrition by G-Day &lt; 50%</li> <li>- Some RG units and 800+ tanks escape</li> </ul> Front-line forces waiting to surrender or destroyed in place <ul style="list-style-type: none"> <li>- Attrition by G-Day &gt; 50%</li> <li>- Morale destroyed by air</li> </ul>

**Table 10. CENTCOM Administrative Chain of Command<sup>98</sup>**

**HQ Central Command (Joint Forces, CENTCOM)**

ARCENT

NAVCENT

CENTAF

MARCENT

SOCCENT

HQ British Forces

HQ French Forces

HQ Joint Forces Command

Saudi Arabia, Egypt, Kuwait, Oman, UAE, Pakistan, Afghan

Other National Forces

Czech, Bangladesh, Morocco, Senegal, Niger, Poland, South Korea

**Table 11. CENTCOM Operational Chain of Command<sup>99</sup>**

**HQ Central Command (Joint Forces, CENTCOM)**

U.S. 3rd Army

Joint Forces Command (JFC)

MARCENT

CENTAF

SOCCENT

NAVCENT

U.S. 1st Cavalry Division

**Table 12. Joint Air Forces CENTCOM Chain of Command<sup>100</sup>**

**AFCENT**

U.S. Air Force

Saudi Arabia (S.A.) Air Force

British (U.K.) Air Force

French Air Force

Canadian Air Force

Italian Air Force

Kuwaiti Air Force

Bahraini Air Force

Qatari Air Force

UAE Air Force

Omani Air Force

## Outcome and Lessons from the Gulf Conflict.

*Many lessons can be learned from the experiences of the Gulf War, about forces, weapons, and combat doctrine, and especially about the role of airpower.*

**Outcome.** While Coalition forces enjoyed what some may characterize as a relatively quick, easy, and overwhelming victory over Iraq in the Persian Gulf War, one must keep that conflict in perspective. Iraq may have had the world's fourth largest army and sixth largest air force, but it lacked competent military leadership. As a result, Iraq failed to develop and employ a sound, coherent strategy to use its powerful resources to achieve its objectives. In addition, the flat, open terrain of the desert, ideal for air power, helped the Coalition forces immensely.<sup>101</sup>

**Overlapping Phases.** Operation Desert Storm was designed in four joint services overlapping phases: Phase I - Strategic Air Campaign; Phase II - suppression of Iraqi ground-based air defenses; Phase III - direct air attacks on Iraqi ground forces; and, Phase IV - ground campaign to liberate Kuwait with air attacks, sea bombardment, and amphibious landing. The first three phases were actually carried out simultaneously. The air forces achieved what, at the time, was perceived to be overwhelming success, with minimal casualties. Through airpower the

Allied Coalition forces achieved air superiority in the first hours of conflict, and progressed toward control of the air which was achieved by the second week.

*Air Campaign Objectives.* Military and political leaders believed that the five air campaign objectives all were effectively accomplished in overlapping Phases I, II, and III, during the first five weeks of the Gulf Conflict. However, in several areas situations and outcomes observed during the course of the Gulf War varied considerably from results documented in subsequent historical accounts. Incomplete strategic intelligence, poor tactical intelligence and flawed battle damage assessment together proved to be a significant shortcoming of the Coalition effort, and made the difference between short-term success and long-term decided victory. It is important to consider operations and their effects, as summarized in Tables 8 and 9, if meaningful lessons are to be learned.

*Objective One* was to isolate and incapacitate the Iraqi regime, by focusing on selected target sets of leadership command facilities, electricity production facilities, and C3 nodes. It was believed that if Iraq were decisively defeated, Hussein would not remain in power. More than 260 precision and non-precision strikes were carried out against Leadership targets, and another 580 were mounted against C3 targets. Communications links were disrupted considerably, and Saddam Hussein's control was shaken, but his regime was not decapitated, and he remained in power. Attacks against electricity and oil production targets were restricted to avoid long-term damage to Iraq's economic infrastructure. Still, about 890 strikes were mounted. Electricity generation and distribution were rapidly shut down throughout most of Iraq; 88% of capacity was damaged, destroyed, or isolated. Little long-term damage was



experienced, however; following the end of the war capacity was restored rapidly and repair of the main power plant in Baghdad was completed by mid-1992.<sup>102</sup>

*Objective Two* was to gain and maintain air supremacy to permit unhindered air operations, by focusing on selected target sets of strategic integrated air defense system (IADS), air forces, and airfields. Air superiority was effectively established the first day of conflict, and air control was achieved by the tenth day. Coalition forces forced the Iraqi Air Force to remain under cover on their airfields and in hardened shelters, or to flee to Iran. Iraq was largely prevented from effectively employing its radar-guided surface-to-air missiles (SAMs), and its IADS was rendered ineffective.<sup>103</sup>

*Objective Three* was to destroy NBC warfare capability, by focusing on selected NBC facilities target sets. Nearly 1000 strikes were initiated against NBC targets, but incomplete intelligence information at the outset of planning was a contributor to the achievement of only part success. Iraq's nuclear materials and production facilities were much more advanced, extensive, and redundant than U.S. intelligence had indicated. Further, the targets were mobile and less vulnerable to bombing. Thus, Coalition bombing of targeted locations failed to eliminate the existing Iraqi nuclear weapons program. U.N. inspectors concluded that air attacks merely inconvenienced Iraqi plans to field atomic weapons. Attacks on biological warfare research facilities and suspected production plants, as well as suspected refrigerated storage bunkers, were successful. However, U.N. inspectors could not confirm that actual biological weapons had ever existed. Air attacks against chemical weapons capabilities fell well short of destroying them completely; post-war inspections revealed stockpiles of more than 150,000

chemical weapons. Attacks on both biological and chemical weapons research and development facilities did successfully reduce Iraq's post-war threat to its neighbors.<sup>104</sup>

*Objective Four* was to eliminate Iraq's offensive military capability, including key military production, infrastructure, and power projection, by focusing on selected target sets of Scud facilities, naval forces and port facilities, oil refining and distribution facilities, and military storage and production sites. About 1500 strikes were carried out against Iraqi ballistic missile capabilities, including Scud production and launch facilities. Fixed Scud sites were the target of nearly 50% of those attacks; 30% aimed at ballistic missile production and infrastructure targets; only 15% involved attacks on mobile launchers. These efforts were not completely effective during the war, in suppressing Scud launches. Post-war data suggests that despite the level of effort mounted in "Scud-hunting", a few may have been destroyed, but nowhere near the numbers reported during the war; rather, high-fidelity Scud decoys, trucks, or other objects with Scud-like signatures were likely destroyed.<sup>105</sup> Nonetheless, post-war investigation concluded that Coalition air attacks against ballistic missile production and infrastructure contributed to the objective of eliminating Iraqi's offensive threats to the region.<sup>106</sup>

Naval targets included ports and facilities at Basra, Az Zubayr, and Um Qasr, oil terminals, coastal Silkworm missile sites, boats, and vessels. All Iraqi missile boats were damaged or destroyed, except one which escaped to Iran. Only two of the known seven Silkworm missile sites were believed destroyed, despite 45 strikes.<sup>107</sup> Strikes against oil refining facilities were effective, with 90% of capacity rendered inoperative. Considerably less effective were strikes against refined oil storage tanks, with more visible but less damaging results.

Bombing resulted in reduced distribution of petroleum, oil and lubricants (POL) throughout Iraq and the KTO, but none of the damage done to the oil refining infrastructure was long-lasting.<sup>108</sup>

*Objective Five* was to render Iraqi army and mechanized equipment ineffective and cause collapse, by focusing on selected target sets of railroads and bridges, Iraqi army units, and Republican Guard forces.<sup>109</sup> Most of the Coalition air effort flew against Iraqi ground forces and their supply lines, roads, railroads, and bridges. By the end of the war the Iraqi army had suffered about 77% attrition in tanks, 55% in armored personnel carriers, and 90% in artillery. The Republican Guard proved to be a more difficult target, suffering only about half of the attrition percentage, in each of these categories. While considerable damage was done to Iraqi and Kuwaiti roads, railroads, and bridges, results were mixed; some were entirely eliminated, some were damaged but readily repaired or replaced, and others were abandoned to alternate routes. Nonetheless, impact on resupply was significant.<sup>110</sup>

***Joint and Coalition Forces.*** The Gulf Conflict also demonstrated the successful implementation of Joint and Coalition Forces doctrine, in both the thirty eight day air campaign and the 100 hour ground campaign. The successful joint effort was praised by General Schwarzkopf, who, in an address to his troops, told them to remember

...the great Air Force that prepared the way for you and was overhead the entire time you fought...the great Navy pilots...the great ships that were at sea that embargoed and kept the ammunition out of the hands of the enemy...the 1st Tank Division of the U.K. was protecting your right flank. And two divisions of Marines out there making a hard push into Kuwait City with a fine Saudi Arabian force protecting their flank...there were Kuwaitis, Omanis, French Foreign Legion... you were part of a great coalition...we did it as part of a joint team, as part of an international team. We all did it together, we all paid a price, we all shared in the victory.<sup>111</sup>

Despite the praise for Jointness, however, actions following the Gulf War saw the Services each competitively jockeying for the best position and advantage, to promote its own Service's superiority and to shape historical accounts to put the Service's own performance in the very best light.

**Iraqi Lessons.** Analysis of the failures of the Iraqi military strategy suggests several areas where, had Saddam Hussein acted based on an understanding of military strategy, the outcome might have been very different.

The invasion of Kuwait suffered from poor timing, and should have been delayed. The end of the Cold War, the fall of Communism, the reunification of Germany, the changing political climate in Europe, and the shaping of the new world order, all served to amplify the significance of what, at another time, might have been viewed as merely an internal Persian Gulf dispute not warranting intervention. Also, at another time Russia's relations with the U.S. might have resulted in a veto of the U.N. Resolution which opened the door for Coalition actions.

Once begun, the invasion should have proceeded slowly, maintaining the character of a border skirmish. However, because of the intensity of the invasion and the movements towards Saudi Arabia, it was quickly viewed as aggression which threatened world oil production and economic stability.

Once committed, had the invading forces proceeded into Saudi Arabia they could have eliminated the availability of bases and facilities from which to mount operations against Iraqi troops.

U.S. and Coalition forces were extremely vulnerable during the early phase of the Desert Shield operation. Iraqi offensive air and ground attacks could have been launched against the

debarkation ports and troop, supply, and munitions staging areas and operating locations, and Coalition headquarters at Riyadh Air Base. Allowing a five month buildup, acclimation, and training period served only the Coalition, and was a missed opportunity for Iraq's forces to seize the initiative.

Iraq's use of its strong air force, its biological and chemical weapons, and its massive army, in planned offensives against selected Coalition centers of gravity, could not only interfere with the buildup, but also influence the positions of the strong American public and Congress, perhaps diverting their support of a Coalition offensive.

Iraq's opportunity to take the initiative disappeared with the first forceful air strikes of Operation Desert Storm. Once air superiority was established by the Coalition air forces, Iraq still might have used its air and ground forces as part of a strategic military offensive, but it is not likely there was anything Iraq could have done to avoid defeat.

**U.S. Lessons.** The U.S. can learn many lessons from the Coalition experience in the Gulf War, about forces, weapons, and combat doctrine, and especially about the role of airpower. Despite remarkable successes, there were numerous weaknesses encountered.

Dr. Edward Warner, Assistant Secretary of Defense for Strategy and Resources, acknowledged that the Gulf War experiences, its strengths and weaknesses, influence current planning. He noted that improved early response capability during the opening stages of theater war must be developed, including "...greater use of pre-positioned equipment, improving airlift capabilities and bolstering the firepower of units" first arriving in theater.<sup>112</sup>

USAF Lieutenant General Charles Horner, as chief of U.S. Space Command (who had served as CENTAF Commander and JFACC during Desert Storm), noted that "The way we

gather and disseminate data... is our vulnerability.” He cited the need to disperse more, control emissions, camouflage, make computers immune to viruses, alternate communications, and protect command and control networks.<sup>113</sup>

In a joint Senate Committee on Armed Services Subcommittees hearing, the focus was on progress on the lessons of the Gulf War. Emphasis was on the need for improvements in capabilities for clearing land and sea mines, all weather tactical reconnaissance, strategic lift, communications interoperability, tactical missile defense, and battle damage assessment. Military Readiness and Defense Infrastructure Subcommittee member Senator John McCain of Arizona cited as one of the most important lessons: “When our national interests are threatened we should act decisively in a way which will achieve clear policy objectives....The single most important lesson from the war in the desert is the crucial importance of highly trained, motivated, and ready military personnel...The big lesson is all about leadership, American leadership. The coalition for the Gulf War was formed because America led and because America was nearly strong enough to execute unilaterally.”<sup>114</sup>

Others say that despite the fact that the U.S. had the military strength required to act alone, Allied Coalition action was needed for political reasons. Military analyst Charles Krauthammer noted that the Coalition experience in the Gulf War is viewed as evidence of a new era of collective security, the indispensability of coalition politics, and the resurgence of the U.N. He argues, however, that it is an example of pseudo-multilateralism, required by some Americans who doubt the legitimacy of unilateral U.S. action. He warns that multilateralism provides the required cover for unilateral American action, but that it forfeits U.S. freedom of action.<sup>115</sup>

At the same Armed Services Subcommittees hearing, Coalition Defense and Reinforcing Forces Subcommittee member Senator Dirk Kempthorne of Idaho referred to five general lessons of the Gulf War identified in an April 1992 DoD report to Congress. They included: 1) decisive presidential leadership set clear goals, inspired confidence in sense of purpose, and rallied domestic and international support; 2) high technology weapons and innovative, effective doctrine gave U.S. and Coalition forces the edge; 3) the high quality, ready, well-trained, brave and disciplined military assured victory; 4) sound planning, forward presence, and strategic lift are critical; and 5) it takes a long time to build those high quality forces and systems.<sup>116</sup> In his testimony Dr. Warner also cited these lessons, as well as the importance of Joint Military Doctrine.<sup>117</sup>

In an interview marking the fifth anniversary of the Desert Storm victory, Retired USAF Lieutenant General Buster Glosson, who was responsible for planning the air campaigns (and executing much of it), cited several problems which, despite our impressive experience in the Gulf Conflict, are not yet satisfactorily resolved. Necessary technology improvements still not realized include all-weather precision munitions, all-weather airlift and landing capability, intelligence gathering and information dissemination, high-resolution imagery to support battle damage assessment, and cruise and tactical ballistic missile defense.<sup>118</sup>

Gulf War experience showed that precision and accuracy are needed for improved strategic intelligence, as well as tactical intelligence and battle damage assessment capabilities. This should include integrated collection, distribution, and exploitation of timely imagery and other intelligence information regarding enemy capabilities, the target area, specific targets, and results of weapons delivery.

In the Gulf War each Service demonstrated its own unique strengths and capabilities, which Joint Doctrine should continue to exploit and harmonize. Planning and execution of coordinated joint operations requires continued, increased emphasis and commitment, and joint exercises. Interservice rivalries must be set aside, so that needed capabilities are harnessed regardless of the Services involved. At the same time, the concept of Service parity, or the use of all Services in an operation even when not specifically required, should be discontinued.

Political and military actions prior to the conflict indicate that remarkable progress has been made in recognizing the need to define specific national interests, clear military objectives, military strategies, and desired end states, prior to committing military forces to conflict. Despite this, however, our political and military leaders still have important strategic lessons to learn about war as a military means to achieve political objectives. Military strategy and operations must satisfy those political objectives. Commitment must recognize the dark reality of conflict and its certain destruction and loss of life. Specific criteria must be identified and met before conflict is terminated, regardless of real or anticipated negative citizen reaction to bloodshed and death. In addition, clear planning is needed for termination of conflict, and transitioning of power to the appropriate authorities following conflict termination.

Most important, the Gulf War experience demonstrated the extraordinary capabilities of airpower when executed using proven Aerospace Doctrine and AirLand Battle Doctrine, and employing sophisticated precision weapon systems to acquire and destroy targets. In summarizing airpower performance in the Gulf War, military defense analysts Michael R. Gordon and Lieutenant General Bernard E. Trainor, USMC (Retired), wrote: "...air attacks made the Iraqis physically incapable of mounting an effective defense... [and] crippled the Iraqi war



machine. [Airpower] neutralized sophisticated air defense systems, destroyed bridges and road junctions, destroyed the Iraqi artillery, and made it all but impossible for Iraq to maneuver forces on the battlefield...it delivered a devastating psychological blow...at negligible cost to [the air forces]. Gordon and Trainor pointed out that despite the overwhelming performance of the air forces, the military commanders were unable to achieve victory through airpower alone; ground war was required. The thirty nine days of bombing paved the way for the ground war to be won, in just 100 hours.<sup>119</sup>

The Gulf War demonstrated the potential for a new kind of conflict and a new strategy for waging war. In his book documenting the role of airpower in the Persian Gulf War, James P. Coyne wrote: "The Gulf War set a new standard: to win quickly, decisively, with overwhelming advantage, and with few casualties."<sup>120</sup>

## Summary and Recommendations.

*These various factors discussed support the position that United States Air Force (USAF) Aerospace Doctrine played the dominant role in the warfighting strategy employed in the Persian Gulf War. A highly skilled, professional military force executed the well-planned air campaign with precision. Application of Army AirLand Battle Doctrine in the final phase of the conflict assured victory for the Coalition.*

The Persian Gulf War provides a basis for understanding and applying military doctrine and strategy for improvement of military performance in future conflicts. **United States Air Force (USAF) Aerospace Doctrine, which evolved throughout more than eighty years of military powered flight, played the dominant role in the warfighting strategy employed in the Persian Gulf War. A highly skilled, professional military force, exploiting advanced airpower capabilities using high-technology weaponry, executed the well-planned air campaign with precision. Application of Army AirLand Battle Doctrine in the final phase of the conflict assured victory for the Coalition.**

**Summary of Findings.** Consideration of several strategic elements of the Gulf War contribute to this conclusion. Political objectives and strategies, military leadership and strengths, technology and manpower, airpower doctrine, and other strategic factors influenced the military strategies of the opposing forces during the Gulf Conflict. Assessment of the successes and failures of those forces, using the Principles of War as an analytical framework, showed that not all objectives were successfully achieved. Many lessons can be learned from the experiences of the Gulf War, about forces, weapons, and combat doctrine, and especially about the role of airpower.

**Recommendations.** Consideration of these findings suggests several areas which warrant further analysis. Our experience in Operation Desert Storm can serve as a possible model for military planners and theorists, as we prepare for future conflicts. We should not make the mistake of becoming so captivated by operational successes that we overlook operational shortcomings. These issues require continued attention, funding, and research, to assure that U.S. forces can successfully deter, and if necessary fight and win, in future conflicts in support of national interests.

We must assume that in those future conflicts the opposition will be better schooled in military leadership and strategy, and we must assure that our own leaders are knowledgeable, as well.

We must not enter into conflict unless our national interests are at stake, and until clear strategic objectives, a clear end state, and termination plans, are defined.

We must continue to acquire, exploit, and deploy improved, high-technology weapon systems, and to maximize the utilization of airpower capabilities.

We must continue to improve development of and commitment to Service and Joint Doctrine, and the lessons of the Gulf War must be reflected in that new doctrine.

We must continue to plan, equip, train, and support our national defense resources, in order to achieve assured national security.

## End Notes

- 
- <sup>1</sup> Sawyer, Ralph D., The Art of War, Boulder, Colorado, Westview Press, 1994, p. 167.
- <sup>2</sup> Galvin, John R., "What's the Matter with Being a Strategist?", Parameters, March 1992, pp. 2-10, in Air War College Associate Programs, Vol. I, Lesson 1, 4th Ed., pp. 6-10, (p. 6).
- <sup>3</sup> Aspin, Rep. Les and Dickinson, Rep. William, Defense for a New Era: Lessons of the Persian Gulf War, NY, Brassey's (US), Inc., 1992, pp. 3-4.
- <sup>4</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 38.
- <sup>5</sup> Sciolino, Elaine, The Outlaw State: Saddam Hussein's Quest for Power and the Gulf Crisis, NY, John Wiley & Sons, Inc., 1991, pp. 13-17.
- <sup>6</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, pp. 17-18.
- <sup>7</sup> Blackwell, James, Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War, NY, Bantam Books, 1991, pp. 66-67; also, Hilsman, Roger, George Bush vs. Saddam Hussein: Military Success! Political Failure?, Novato, CA, Lyford Books, Presidio Press, 1992, pp. 41-42.
- <sup>8</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 35.
- <sup>9</sup> Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, p. xxix.
- <sup>10</sup> Triumph without Victory: The Unreported History of the Persian Gulf War, U.S. News & World Report, NY, Times Books, 1992, p. 68.
- <sup>11</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 36.
- <sup>12</sup> Cheney, Dick, "Overview: The Conduct of the Persian Gulf War", Conduct of the Persian Gulf War: Final Report to Congress, Department of Defense, April 1992, pp. i-xxviii, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 201-212, (pp. 202-203).
- <sup>13</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 53.
- <sup>14</sup> Cheney, Dick, "Overview: The Conduct of the Persian Gulf War", Conduct of the Persian Gulf War: Final Report to Congress, Department of Defense, April 1992, pp. i-xxviii, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 201-212, (p. 202).
- <sup>15</sup> Hallion, Richard P., Storm Over Iraq: Air Power and the Gulf War, Washington, D.C., Smithsonian Institution, 1992, p. 243.
- <sup>16</sup> "The Air Campaign", Conduct of the Persian Gulf War: Final Report to Congress, April 1992, pp. 87-181, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 213-269, (p. 213).
- <sup>17</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, pp. 53-54.
- <sup>18</sup> Sciolino, Elaine, The Outlaw State: Saddam Hussein's Quest for Power and the Gulf Crisis, NY, John Wiley & Sons, Inc., 1991, p. 32.

- <sup>19</sup> Pyle, Richard, Schwarzkopf, In His Own Words: The Man, the Mission, the Triumph, NY, Signet, 1991, p. 254; also, Cohen, Roger and Gatti, Claudio, In the Eye of the Storm: The Life of General H. Norman Schwarzkopf, NY, Farrar, Straus and Giroux, 1991, p. 293; also, David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, back cover.
- <sup>20</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, pp. 60-61; also, Hilsman, Roger, George Bush vs. Saddam Hussein: Military Success! Political Failure?, Novato, CA, Lyford Books, Presidio Press, 1992, p. 102; also, Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, pp. 301-302.
- <sup>21</sup> Hallion, Richard P., Storm Over Iraq: Air Power and the Gulf War, Washington, D.C., Smithsonian Institution, 1992, pp. 116-117.
- <sup>22</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 16, 52, 181.
- <sup>23</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 18.
- <sup>24</sup> Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, p. 302.
- <sup>25</sup> Sciolino, Elaine, The Outlaw State: Saddam Hussein's Quest for Power and the Gulf Crisis, NY, John Wiley & Sons, Inc., 1991, p. 27; also, Pyle, Richard, Schwarzkopf, In His Own Words: The Man, the Mission, the Triumph, NY, Signet, 1991, p. 117.
- <sup>26</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, pp. 60-61.
- <sup>27</sup> Pyle, Richard, Schwarzkopf, In His Own Words: The Man, the Mission, the Triumph, NY, Signet, 1991, p. 116.
- <sup>28</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 63.
- <sup>29</sup> "Air Power's Ultimate Test", U.S. News & World Report, January 28, 1991, Vol. 110, No. 3, pp. 28-33, (pp. 30-33).
- <sup>30</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 216.
- <sup>31</sup> Aspin, Rep. Les and Dickinson, Rep. William, Defense for a New Era: Lessons of the Persian Gulf War, NY, Brassey's (US), Inc., 1992, pp. 18-19.
- <sup>32</sup> Sweetman, Bill, "Catching Up with Doctrine", Jane's Defence Weekly, 29 June 1991, Vol. 15, No. 26, pp. 1174-1175. (p. 1174).
- <sup>33</sup> Powell, Colin L. and Persico, Joseph E., My American Journey, NY, Random House, 1995, pp. 509-510; also, Ethell, Jeff, "Lessons from Desert Storm's Air War", Aerospace America, May 1991, Vol. 29, No. 5, pp. 16-18; also, "U.S. Army Aviation: The Gulf and Beyond", Military Technology, April 1991, Vol. XV, No. 4/91, pp. 25-27; also, Eshel, Tamir, "The Most Successful Air Campaign Ever?", Military Technology, April 1991, Vol. XV, No. 4/91, pp. 36-44, (pp. 38-41).
- <sup>34</sup> Hilsman, Roger, George Bush vs. Saddam Hussein: Military Success! Political Failure?, Novato, CA, Lyford Books, Presidio Press, 1992, p. 102.

- 
- <sup>35</sup> Hallion, Richard P., Storm Over Iraq: Air Power and the Gulf War, Washington, D.C., Smithsonian Institution, 1992, p. 119.
- <sup>36</sup> Hallion, Richard P., Reaching Globally, Reaching Powerfully: The USAF in the Gulf War. A Report, Sep 1991, pp. 2-3.
- <sup>37</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 28-31.
- <sup>38</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 5-6, 146.
- <sup>39</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 16, 35-40.
- <sup>40</sup> Schwarzkopf, H. Norman and Petre, Peter, General H. Norman Schwarzkopf: The Autobiography: It Doesn't take a Hero, NY, Bantam Books, 1992, pp. 318-320.
- <sup>41</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 47-48.
- <sup>42</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, pp. 2-1 - 2-4; also, Palmer, Michael A., "The Storm in the Air: One Plan, Two Air Wars?", Air Power History, Vol. 39, No. 4, Winter 1992, pp. 24-31, (p. 24).
- <sup>43</sup> Palmer, Michael A., "The Storm in the Air: One Plan, Two Air Wars?", Air Power History, Vol. 39, No. 4, Winter 1992, pp. 24-31, (p. 24).
- <sup>44</sup> Coyne, James P., Airpower in the Gulf, Arlington, VA, Air Force Association, 1992, p. 178.
- <sup>45</sup> Coyne, James P., Airpower in the Gulf, Arlington, VA, Air Force Association, 1992, p. 178.
- <sup>46</sup> Schwarzkopf, H. Norman and Petre, Peter, General H. Norman Schwarzkopf: The Autobiography: It Doesn't take a Hero, NY, Bantam Books, 1992, pp. 362, 382-384.
- <sup>47</sup> David, Peter, Triumph in the Desert: The Challenge, the Fighting, the Legacy, NY, Random House, 1991, p. 64.
- <sup>48</sup> Hiro, Dilip, Desert Shield to Desert Storm: The Second Gulf War, NY, Routledge, Chapman and Hall, Inc., 1992, p. 525.
- <sup>49</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 228.
- <sup>50</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, pp. 226-227.
- <sup>51</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 103.
- <sup>52</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 203.
- <sup>53</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 203.

- 
- <sup>54</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, pp. 2-4 - 2-5.
- <sup>55</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-5; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 10.
- <sup>56</sup> Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, pp. 435-436.
- <sup>57</sup> "The Air Campaign", Conduct of the Persian Gulf War: Final Report to Congress, April 1992, pp. 87-181, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 213-269., (pp. 216-220).
- <sup>58</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-6; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 10.
- <sup>59</sup> Bonsignore, Ezio, "The War that Wasn't", Military Technology, March 1991, Vol. XV, No. 3/91, pp. 59-62, (pp. 59-60).
- <sup>60</sup> Eshel, Tamir, "The Most Successful Air Campaign Ever?", Military Technology, April 1991, Vol. XV, No. 4/91, pp. 36-44, (p. 37); also, "After the Storm: First Lessons", Jane's Defence Weekly, 6 April 1991, Vol. 15, No. 14, pp. 527-537, (p. 530).
- <sup>61</sup> Aspin, Rep. Les and Dickinson, Rep. William, Defense for a New Era: Lessons of the Persian Gulf War, NY, Brassey's (US), Inc., 1992, pp. 37-38.
- <sup>62</sup> Eshel, Tamir, "The Most Successful Air Campaign Ever?", Military Technology, April 1991, Vol. XV, No. 4/91, pp. 36-44, (p. 43).
- <sup>63</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-7; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 11.
- <sup>64</sup> Blackwell, James, Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War, NY, Bantam Books, 1991, p. 56.
- <sup>65</sup> Summers, Harry G., Jr., Col. (Ret.), On Strategy II: A Critical Analysis of the Gulf War, NY, Dell, 1992, pp. 194-198.
- <sup>66</sup> Eshel, Tamir, "The Most Successful Air Campaign Ever?", Military Technology, April 1991, Vol. XV, No. 4/91, pp. 36-44, (p. 44).
- <sup>67</sup> "After the Storm: First Lessons", Jane's Defence Weekly, 6 April 1991, Vol. 15, No. 14, pp. 527-537, (pp. 529-530).
- <sup>68</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-7; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 11.
- <sup>69</sup> Gordon, Michael R., and Trainor, Bernard E., General (Ret.), The Generals' War: The Inside Story of the Conflict in the Gulf, Massachussetts. Little, Brown, Uncorrected Advance Proof, 1995, p. 474.
- <sup>70</sup> Summers, Harry G., Jr., Col. (Ret.), On Strategy II: A Critical Analysis of the Gulf War, NY, Dell, 1992, pp. 208-212.
- <sup>71</sup> Eshel, David, "Checkmate in Kuwait", Military Technology, March 1991, Vol. XV, No. 3/91, pp. 54-58, (p. 56).



<sup>72</sup> Eshel, David, "Checkmate in Kuwait", Military Technology, March 1991, Vol. XV, No. 3/91, pp. 54-58, (p. 54).

<sup>73</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-7; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 11.

<sup>74</sup> Blackwell, James, Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War, NY, Bantam Books, 1991, pp. 57, 151.

<sup>75</sup> Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, p. 301; also, "After the Storm: First Lessons", Jane's Defence Weekly, 6 April 1991, Vol. 15, No. 14, pp. 527-537, (p. 537).

<sup>76</sup> Baker, James A. III and DeFrank, Thomas M., The Politics of Diplomacy: Revolution, War and Peace, 1989-1992, NY, G. P. Putnam's Sons, 1995, p. 409.

<sup>77</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-8; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 12.

<sup>78</sup> Blackwell, James, Thunder in the Desert: The Strategy and Tactics of the Persian Gulf War, NY, Bantam Books, 1991, p. 56.

<sup>79</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 135.

<sup>80</sup> Pyle, Richard, Schwarzkopf, In His Own Words: The Man, the Mission, the Triumph, NY, Signet, 1991, p. 264.

<sup>81</sup> Triumph without Victory: The Unreported History of the Persian Gulf War, U.S. News & World Report, NY, Times Books, 1992, p. 400.

<sup>82</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 152.

<sup>83</sup> Schwarzkopf, H. Norman and Petre, Peter, General H. Norman Schwarzkopf: The Autobiography: It Doesn't take a Hero, NY, Bantam Books, 1992, pp. 468-472; also, Powell, Colin L. and Persico, Joseph E., My American Journey, NY, Random House, 1995, pp. 520-523; also, Baker, James A. III and DeFrank, Thomas M., The Politics of Diplomacy: Revolution, War and Peace, 1989-1992, NY, G. P. Putnam's Sons, 1995, pp. 409-410; also, Cohen, Roger and Gatti, Claudio, In the Eye of the Storm: The Life of General H. Norman Schwarzkopf, NY, Farrar, Straus and Giroux, 1991, pp. 294-299.

<sup>84</sup> Summers, Harry G., Jr., Col. (Ret.), On Strategy II: A Critical Analysis of the Gulf War, NY, Dell, 1992, p. 176.

<sup>85</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-6; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 12.

<sup>86</sup> Palmer, Michael A., "The Storm in the Air: One Plan, Two Air Wars?", Air Power History, Vol. 39, No. 4, Winter 1992, pp. 24-31, (p. 25).

<sup>87</sup> Sweetman, Bill, "Catching Up with Doctrine", Jane's Defence Weekly, 29 June 1991, Vol. 15, No. 26, pp. 1174-1175, (p. 1174); also, Ethell, Jeff, "Lessons from Desert Storm's Air War", Aerospace America, May 1991, Vol. 29, No. 5, pp. 16-18, (p. 17); also, Eshel, David, "Checkmate in Kuwait", Military Technology, March 1991, Vol. XV, No. 3/91, pp. 54-58, (p. 55).

<sup>88</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-6; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 13.

- 
- <sup>89</sup> Sciolino, Elaine, The Outlaw State: Saddam Hussein's Quest for Power and the Gulf Crisis, NY, John Wiley & Sons, Inc., 1991, p. 26.
- <sup>90</sup> "The Air Campaign", Conduct of the Persian Gulf War: Final Report to Congress, April 1992, pp. 87-181, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 213-269, (p. 224).
- <sup>91</sup> Eshel, David, "Checkmate in Kuwait", Military Technology, March 1991, Vol. XV, No. 3/91, pp. 54-58, (p. 55).
- <sup>92</sup> AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, January 1984, p. 2-8; also, AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, Vol. II, March 1992, p. 13.
- <sup>93</sup> "The Air Campaign", Conduct of the Persian Gulf War: Final Report to Congress, April 1992, pp. 87-181, in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 213-269, (pp. 220-222).
- <sup>94</sup> Cohen, Roger and Gatti, Claudio, In the Eye of the Storm: The Life of General H. Norman Schwarzkopf, NY, Farrar, Straus and Giroux, 1991, p. 228.
- <sup>95</sup> Freedman, Lawrence and Karsh, Efraim, The Gulf Conflict, 1990 - 1991: Diplomacy and War in the New World Order, Princeton, NJ, Princeton University Press, 1993, p. 330.
- <sup>96</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 42.
- <sup>97</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 118-119.
- <sup>98</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 136.
- <sup>99</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 137.
- <sup>100</sup> Watson, Bruce W., et al., Military Lessons of the Gulf War, Novato, CA, Presidio Press, 1991, p. 142.
- <sup>101</sup> Cohen, Roger and Gatti, Claudio, In the Eye of the Storm: The Life of General H. Norman Schwarzkopf, NY, Farrar, Straus and Giroux, 1991, p. 228.
- <sup>102</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 70-75.
- <sup>103</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 56-64.
- <sup>104</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 78-82.
- <sup>105</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 83-90.
- <sup>106</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 85.
- <sup>107</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 99-101.

---

<sup>108</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, pp. 76-77, 93-98.

<sup>109</sup> "Strategy, Air Power, and the Middle East, Part II: The Gulf War", in Air War College Associate Programs, Vol. I, Lesson 11, 4th Ed., pp. 213-217, 252-255.

<sup>110</sup> Keaney, Thomas A., and Cohen, Eliot A., Gulf War Air Power Survey Summary Report, Washington DC, U.S. Government Printing Office, 1993, p. 106.

<sup>111</sup> Pyle, Richard, Schwarzkopf. In His Own Words: The Man, the Mission, the Triumph, NY, Signet, 1991, pp. 266-267.

<sup>112</sup> Morrocco, John D., "U.S. Uses Gulf War to Frame New Strategy", Aviation Week and Space Technology, January 17, 1994, Vol. 140, No. 3, pp. 40-41.

<sup>113</sup> Fulghum, David A., "Planners Seek to Exploit U.S. Technology Lead", Aviation Week and Space Technology, January 17, 1994, Vol. 140, No. 3, pp. 51-52.

<sup>114</sup> "Implementation of Lessons Learned from the Persian Gulf Conflict", Joint Hearing before the Subcommittee on Coalition Defense and Reinforcing Forces and the Subcommittee on Military Readiness and Defense Infrastructure of the Committee on Armed Services, United States Senate, April 18, 1994, pp. 5-7.

<sup>115</sup> Krauthammer, Charles, "The Lonely Superpower", The New Republic, July 29, 1991, pp. 23-27.

<sup>116</sup> "Implementation of Lessons Learned from the Persian Gulf Conflict", Joint Hearing before the Subcommittee on Coalition Defense and Reinforcing Forces and the Subcommittee on Military Readiness and Defense Infrastructure of the Committee on Armed Services, United States Senate, April 18, 1994, p. 8.

<sup>117</sup> "Implementation of Lessons Learned from the Persian Gulf Conflict", Joint Hearing before the Subcommittee on Coalition Defense and Reinforcing Forces and the Subcommittee on Military Readiness and Defense Infrastructure of the Committee on Armed Services, United States Senate, April 18, 1994, pp. 12-29.

<sup>118</sup> Fulghum, David A., "Glosson: U.S. Gulf War Shortfalls Linger", Aviation Week and Space Technology, January 29, 1996, Vol. 144, No. 5, pp. 58-65.

<sup>119</sup> Gordon, Michael R., and Trainor, Bernard E., General (Ret.), The Generals' War: The Inside Story of the Conflict in the Gulf, Massachusetts, Little, Brown, Uncorrected Advance Proof, 1995, pp. 474-475.

<sup>120</sup> Coyne, James P., Airpower in the Gulf, Arlington, VA, Air Force Association, 1992, p. 173.